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AUTHOR Dupre, Beverly Brown
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ABSTRACT

Interest in gaming and simulation, as traced back in educational history to the late 1800s, has prompted educators to consider gaming and simulation as a curriculum process which employs the utilization of symbolic models for the attainment of defined goals. In an attempt for schools to be accountable, gaming and simulation is considered to be a process which enables schools to construct learning environments for students which are more congruent with the real world. The process necessitates having assistance from the local community. The role of the community would be to provide settings, materials, and supplementary artifacts which would represent the real world. All endeavors of society could be represented. Examples of community sectors that could assist in bringing awareness of their operations to students for the purpose of exploration and valuing could include various businesses, labor trade unions, manufacturing, marketing, service, and governmental agencies. (Author)

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COMMUNITY-SCHOOL CONGRUENCY THROUGH USE OF INSTRUCTIONAL GAMING AND SIMULATION

Beverly Brown Dupre'
Associate Professor of Education
Southern University in New Orleans

INTRODUCTION

> "Instructional gaming and simulation is a rather recently organized learning innovation which employs persons in surrogate roles for play-like activities designed to facilitate decision making competency in specialized areas of concern." (Cassell, 1974)

Instructional gaming and simulation is viewed as a means of enabling schools to become places where learning environments are constructed which are congruent with the real world.

As a means of avoiding a disparity between children's experiences in school and their encounters in the community, researchers are recommending the employment of process education. Process education is interpreted to be a teaching strategy which is implemented through use of gaming and simulation. This learning process can be facilitated with assistance from community agencies, businesses and corporations. This assistance may be rendered in the form of providing supplementary materials and graphics,

representing various sectors of society as a means of bringing the real world to the schools.

Gaming and simulation is a heuristic approach to education and it is viewed as a means of relating and validating instructional functioning. Gaming and simulation is considered to be a means of defining performance goals in a manner which can be exciting and refreshing. This enthusiasm is shared with the community because the educative strategy provides opportunities for the school and the community to plan together. Interdependence between the two is established. The school and the community ultimately assist each other in the development of knowledgeable, employable and responsible future adults.

The major goal of this paper is to provide information concerning community-school congruency through the strategy of gaming and simulation. This strategic process will be viewed in relation to its curriculum organizational pattern. Additionally, the role of the community in contributing to the success of this strategy will be explored. Examples will be cited as a means of showing the apparent universality and adaptability of this educative strategy. Gaming and simulation will also be viewed

as it encompasses all levels of learning, provides meaningful experiences, and enables optimum development for the student.

Gaming and simulation will be explored in perspective to the writings by researchers in the field. Areas included are: (1) interpretations of the topic; (2) genealogy; (3) basic principles; (4) usage illustrations; and (5) outcome assessments.

INTERPRETATIONS OF THE TOPIC

Commonly accepted usage of the terms gaming and simulation vary considerably. A review of literature related to the area presents the interpretations of many authorities in the field.

Holloway (1974) interprets gaming and simulation to be real-world representations without undue loss. He states that in the sciences, physical models are widely recognized and readily accepted as representations of real world phenomena. In the social and behavioral sciences, such models are more frequently found in the form of schematics or symbols. Local science corporations could contribute display materials or artifacts as a means of assisting schools in establishing related simulated settings. These contributions would provide enriched student

experiences thereby making learning meaningful.

Holloway further states that unquestionably, simulations, whether physical models, or symbol analogues, or mere role playing, have added important dimensions to instructional methodology. Space exploration, military training, market and driver training are just a few examples of simulation and gaming.

Stambler (1972) interprets gaming and simulation as an approach involving the transferring of structure and the decision-making process into a manageable and meaningful classroom experience. He states that the process is characterized by an open-ended quality which allows a logical flow from one week to the next. It enables past problems to be recast in light of new problem experiences. Stambler further states that in the "simulation of a problem," role playing, socio drama and simulated consequential decision-making are incorporated as parts of an integrated process.

Gordon(1970) states that the term "gaming" is derived from the concept of child play. In gaming two or more persons are involved in an interaction, and all except one may be assigned fictional or defined roles. There is always a competitive element present

designed to obtain solutions for goal attainment. This is accomplished through a heuristic development of tactics and strategies. These take place under a common and well defined set of rules, and may involve individuals in surrogate and defined or fictional roles. Efforts are made to incite enthusiasm, personal vigor, and the kind of emotional or ego-involvement present in typical child play.

Tansey and Unwin (1969) state that simulation is concerned with the function of fidelity in relation to some aspect of real life. The activities and assigned roles replicate and mimic corresponding parts of our culture. The use of other players is not essential. A single player may become involved in a carefully structured learning experience. Sometimes forces of nature are assigned competing roles with one or more real players in surrogate roles. Assistance provided from local or national meteorological offices could assist in adding depth to this activity.

Cassell (1974) states that the instructional aspects of gaming and simulation have served to introduce accountability to the learning arena. He states that carefully defined expected outcomes, in terms of specific performance of individuals, are the

rule. Cassell further states that the defining of surrogate roles lends itself admirably to the establishment of an isomorphic or identical relationship. This relationship exists between the ensuing activity and the rather precise performance expected by participants. Typically emphasis is placed upon knowledge of progress, involving self-evaluation. Success is related to the degree of self-direction exhibited by the learning participants. Local testing laboratories could be of service in these endeavors by assisting schools in designing evaluative instruments. These instruments would enable concurrent evaluations to occur and accurately assess goal achievement.

GENEALOGY OF THE CONCEPT

John Dewey, in The School and Society (1899), expressed as one of his major concerns the disparity that exists between what children experience in school and what they encounter in the community. To correct this discontinuity, Dewey proposed that schools become miniature, embroyonic societies. Schools founded by Dewey and his followers in the first two decades of the 20th Century involved students in community-related activities. According to John and Evelyn Dewey, in Schools of Tomorrow (1915), these

schools provided opportunities for the study of occupations and self-government.

Psychological implications of play activity in relation to the social development of the child may be traced to the early work of G. Stanley Hall in 1907. Hall maintained that play sets the stage and affords an attractive theatre for continuity and regularity of growth that parallels and serves as a requisite for late and more mature responsibilities.

The work of Arnold Gesell at the Yale University Child Development Clinic in 1943 served to sharpen concepts concerning the nature of play and to identify critical factors not really present in other activities. Included were such factors as spontaneity, surrogate role playing motivation, and satisfaction.

Cassell (1974) states that the now famous book published by Princeton University, Theories of Games And Economic Behavior, is credited as being the nucleus for gaming and simulation. This evolved as a result of French and German educators who defined various strategies. During World War II gaming and simulation was used by many nations for military training purposes. The "Link Trainer" for pilot training was used for initial and in-service purposes.

Cassell further states that the most impressive use of gaming and simulation was demonstrated by Dean Russell at Columbia University for military citizenship training programs. As a result of brainwashing of military personnel during the Korean conflict, this program was implemeted throughout military basic training programs. Military personnel were obliged to play surrogate roles in a wide variety of different situations bearing on critical factors related to citizenship--the notion being that our national allegiance was rather poorly defined, and that the selective surrogate role playing would serve to strengthen bonds pertinent to citizenship.

Cremin (1961), in the Transformation of Schools, states that with the advent of progressive education movement, the miniature society concept advocated by Dewey was displaced by the child-centered curriculum. But Richmond, in The Micro-Society School: A Real World in Miniature (1973), states that recently there has been a rebirth of interest in building miniature societies in schools. Elaborate models have been developed including George Richmond's Micro-Society School (1973), William Jarvis' Micro-Community (1974), and Marilyn Kourilsky's Mini-Society (1974.

Holloway (1974) states that technological development which began in the late 1950's, has influenced the use of another aspect of simulation in schools. He states that this is true where the technology of computers and education are concerned. He labels this specific structure with the term computer simulation. He further states that the period from the middle 1960's to the early 1970's was characterized by a momentum to increase efforts in the educational sphere in the use of computer assisted instruction.

Currently, implementation of strategies employing gaming and simulation are utilized throughout the nation's schools and in training programs. Operational analysis personnel are making use of gaming and simulation for purposes of achieving specifically defined performance objectives. Elementary and secondary schools are creating living communities in classroom environments as a means of enabling students to understand the responsibilities and benefits from exchanging ideas and working together. Tanner (1976) reports in an article entitled "Teaching about the Nuclear Power Controversy by Simulation," that secondary school students become directly involved in the simulated

learning situation. Students assume the roles of congressional committees for the purpose of researching the nature of the controversy. Cognitive information, which is an inherent product of the simulated setting, serves as the basis for alternative views expressed by the students.

Basic Principles

A review of professional literature pertaining to the use of instructional gaming and simulation infer basic principles for the development of gaming and simulation as a learning process. The inferences are as follows:

1. Learning Through Involvement
   All players are involved. Oftern group decisions become the rule.

2. Life Like Situations
   Some well defined arena in man's life-space is usually represented in a simulated model.

3. Off-Limit Areas
   Constraints are in the form of off-limits. Rules must be equally applicable to all players under similar circumstances, and must be adhered to by all involved.

4. Systems Approach
   Activities are designed into sets of conditions that are related. The activities may be self-directed, dependent, schematic, or dysfunctional.

5. Goal Attainment
   A critical relationship exists between goals to be attained and the performance objectives. Contingencies of player confrontations and cohesion of the participants are factors related to goal solutions.

6. Range of Choices
   Decision-making entails an analysis of each of the alternative courses of action, weighing hazards and consequences against expected outcomes.

7. Implementation of Activity
   The stage begins with a resource analysis of the systems planned. An allocation of task assignments for all participants is included. Preparation of time tables or schedules may be incorporated.

8. Evaluation
   A comparison is made between effort and material expanded in proportion to the observed returns as viewed by the participants. One aspect deals with whether or not something was gained.

Newhouse (1974) attributes the following values to the simulation process:

1. allowing participants to resolve social conflicts;
2. providing participants with opportunities to choose rationally among alternatives;
3. encouraging participants to examine the methodologies, concepts, and principles of the subject matter in question;
4. promoting analysis of value positions.

It is suggested that the ebullience for the strategem rests on what is observed as simulation's inherent quality to hold interest and to create enthusiasm. The materials provided by the community

would enable schools to establish a simulated setting. Abt (1968) suggests role playing as being the motivational mechanish for gaming and simulation. Through gaming students would explore ideas and interact with real world situations, thus developing deeper insights.

Usage Illustrations

Use of gaming and simulation is widely acclaimed and diversified. It ranges from exploration of classroom discussion topics to hydraulic harbors and the space program.

William Jarvis' Micro-Community, as reported by Bennett (1976), employs a pervasive format involving students with problems that are faced in real life. The problems include: (1) the development of the democratic process; (2) the building of an economic system consistent with democratic, capitalistic principles; (3) the earning of money to pay rent and taxes; and (4) private enterprise, investments and banking.

The Micro-Community operates everyday during the school year, using a specially printed scrip as the medium of exchange. Students receive money for using their brains effectively in such activities as making constructive comments in class discussions, achieving

high scores on tests, operating a private business, and by earning a salary for performing executive, legislative and judicial tasks. Fines are levied for breaches of citizenship such as tardiness, disruptive behavior in the classroom or any other aspect of deportment needing modification.

Marilyn Kourilsky (1974) describes several distinct stages in constructing the Mini-Society. The first stage in this process involves having the 3rd-4th-5th-6th grade teacher create a scarcity situation within the classroom. When half of the class or more voices dissatisfaction over the scarcity situation, the teacher calls for a class meeting. Such problem-solving discussion groups become the Mini-Society. This initial discussion group does the following: (1) identifies the problem; (2) establishes a list of behaviors that will be rewarded by income; (3) assigns a value to labor; and (4) decides when income will be withheld.

As the children become more involved in the developing Mini-Society, various institutions such as banks and loan companies appear. Insurance companies are also requested by children to guard against theft and loss. To finance student-run business, some

children may solicit their Mini-Society money from investors in exchange for a share of the shop's profits--thus engaging in an informal kind of stock market.

A need for increased communication, particularly for advertising, often occurs. This need can be met through a student newspaper.

Children may be involved in the Mini-Society for as long as the teacher feels the class is deriving educational benefits, but usually 2-3 hours per week. Frequently the social studies period is used for this activity.

Technology had influenced gaming and simulation. Holloway (1974) cites the field of computer simulation for classroom instruction. He states that computer simulation is an approach to the study and further understanding of complex entities and situations.

The computer program is the embodiment of the real-world event or entity of interests. The computer's capability of storing, recombining and reporting the past, current and future states of real-world phenomena comprise the total behavior of a complex event or system. In this sense, the computer exceeds the intellectual capacity of the average person. Students

consequently interact with a process involving study, discovery, programming, testing and modification.

Holloway further states that the criterion of success in computer simulation is the degree to which the output variables (response) are truly representative of parallel indices of behavior in the system of interest. The immediate feedback provided by the computer appears to serve as a motivational mechanism which allows the student to persevere in the activity. The student's interest is maintained, and his acquisition of cognitive information becomes an enjoyable activity.

On the secondary level Tanner (1976) applies another use of simulation through the selection of a topic pertaining to an area of concern. He divides the class into several groups such as Congressional Committees.

The committees hear testimonies from groups who advocate alternative views. The groups utilize information sources as provided in bibliographies. Time is allocated for a group presentation, such as thirty minutes. A briefer time may be allocated for formal rebuttal.

The class participates in rule-making. Formal

decisions are reached based upon member and group allocations viewed in perspective of what the allocations really should be.

Outcome Assessments

As a means of determining the value of gaming and simulation, authorities are concerned with assessment and outcomes associated with the process.

Coleman (1968) states that in order to capture the intrigue of play, designers inject conflict situations into social situations. It is conflict and its intensity which distinguish a simulation from a gaming role-play experience. It is the conflict factor which results in various thresholds of competition.

When a social simulation exhibits a winning or losing consequence, it is a simulation game. Experimentors such as Baker (1966) have found that the competitive aspects of a game do arouse motivation and help sustain interest. Baker reports various studies concerning participants during a simulated exercise. His studies indicate that if the participants were highly involved in a simulated task and if stress were low, the task was perceived as enjoyable.

It was revealed also that the tasks must be perceived as having importance in order for participants

to achieve satisfaction. If the activity is designed to serve a pedagogical function, intensity of conflict should be of little interest to the designer. Communication and cooperation would not be served under intense conflict situations.

The concept of utility, which refers to the inherent values of a gaming simulation that participants strive for, is part of the process. Utility is considered consistent and preferred over several trails. A consistent pattern indicates that a participant has for his goal the maximizing of his desires. Consequently, establishing simulated settings would enable students to interact with a situation repeatedly for the purpose of review or reinforcement.

A corollary to utility is the concept of rationality. Rapaport (1970) pointed to the fact that in a game, the potentialities and evaluations must be taken into account. Unlike a fight, a gaming situation assumes rationality of participants.

Ripple (1964) views the feedback component as a necessary requisite to the simulation experience. He states that feedback can be derived from the interaction of the participants, or from media such as slides, audio, tapes or mimeographed handouts.

Ripple further states that since feedback contributes to expected outcomes, careful analysis of its nature and its medium is mandatory for expediting the flow of information.

SUMMARY

Interest in gaming and simulation, as traced back in educational history to the late 1800's, has prompted educators to consider gaming and simulation as a curriculum process which employs the utilization of symbolic models for the attainment of defined goals. In an attempt for schools to be accountable, gaming and simulation is considered to be a process which enables schools to construct learning environments for students which are more congruent with the real world.

The process necessitates having assistance from the local community. The role of the community would be to provide settings, materials, and supplementary artifacts which would represent the real world. All endeavors of society could be represented. Examples of community sectors that could assist in bringing awareness of their operations to students for the purpose of exploration and valueing could include various businesses, labor, trade unions, manufacturing, marketing, service and governmental agencies.

Gaming and simulation is an educational approach involving the transfer of structure and the decision-making process, into a manageable and meaningful classroom experience. Role playing socio drama and consequential decision-making are incorporated as parts of the process. The notions used in gaming and simulation are interrelated phonomena, and each serves as a complement of the other.

A review of literature suggests that gaming and simulation have added dimensions to instructional methodology. Gaming and simulation are viewed as having added depth and breadth to instruction through its multi-sensory approach. Classroom usage of gaming and simulation ranges from the elementary to the secondary schools. It also extends to computer technology, and training in specialized fields including the military.

Researchers have suggested that the teachers whose classrooms are regularly involved in gaming and simulation processes are able to maintain greater control among their students. It has been suggested that classroom success stems from the fact that gaming and simulation permit students to engage in current and future decision-making. These decisions made by

students are based upon their vicarious involvement in an instructional activity that is viewed as being interesting, challenging and meaningful.

The simulated school setting would include representations and artifacts such as displays, designs and graphics. These simulations would serve to enhance the learning environment of the student, thus stimulating his interest and desire to explore and discover his role as a future adult.

It is suggested that community agencies assist the school system in establishing a community resource compendium which would list all community services, organizations and resources available which would be of value in providing simulation and gaming settings in various schools.

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